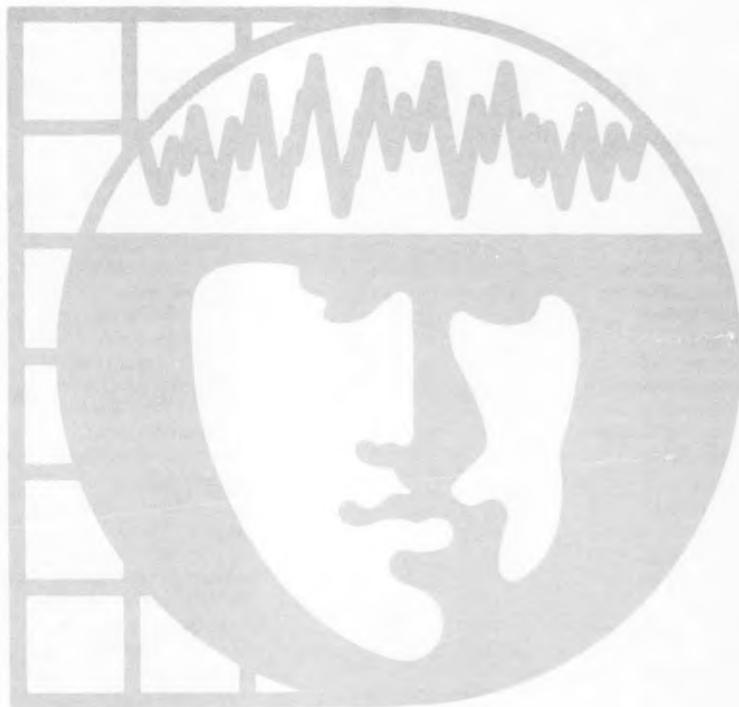


# APPLIED PSYCHOLOGICAL MEASUREMENT



VOLUME 17, 1993

Copyright © 1993 by Applied Psychological Measurement Inc. ISSN 0146-6216  
The publisher assumes no responsibility for any statements of fact or opinion expressed in the published papers or in the announcements.

**Editor**

David J. Weiss,  
*University of Minnesota*

**Editorial Board**

David Andrich,  
*Murdoch University, Australia*

Frank B. Baker,  
*University of Wisconsin*

Peter Bentler,  
*University of California,  
Los Angeles*

Robert L. Brennan,  
*American College Testing  
Program*

David V. Budescu,  
*University of Illinois,  
Urbana-Champaign*

John B. Carroll,  
*University of North Carolina*

Norman Cliff,  
*University of Southern California*

Jacob Cohen,  
*New York University*

Mark L. Davison,  
*University of Minnesota*

René V. Dawis,  
*University of Minnesota*

Dato N. M. de Gruijter,  
*University of Leyden,  
The Netherlands*

Fritz Drasgow,  
*University of Illinois,  
Urbana-Champaign*

Allen L. Edwards,  
*University of Washington*

Gerhard H. Fischer,  
*University of Vienna, Austria*

Eric F. Gardner,  
*Syracuse University*

Lewis R. Goldberg,  
*University of Oregon*

Bert F. Green,  
*Johns Hopkins University*

Ronald K. Hambleton,  
*University of Massachusetts*

Willem J. Heiser,  
*University of Leiden,  
The Netherlands*

Wayne H. Holtzman,  
*University of Texas at Austin*

Lloyd G. Humphreys,  
*University of Illinois,  
Urbana-Champaign*

Douglas N. Jackson,  
*University of Western Ontario,  
Canada*

Lawrence E. Jones,  
*University of Illinois,  
Urbana-Champaign*

Robert L. Linn,  
*University of Colorado*

Clifford E. Lunneborg,  
*University of Washington*

Robert MacCallum,  
*Ohio State University*

John E. Overall,  
*University of Texas*

Joseph Lee Rodgers,  
*University of Oklahoma,  
Book Review Editor*

Fumiko Samejima,  
*University of Tennessee*

Takahiro Sato,  
*NEC Corporation, Japan*

Lyle Schoenfeldt,  
*Texas A&M University,  
Computer Program  
Exchange Editor*

Sukeyori Shiba,  
*University of Tokyo, Japan*

Yoshio Takane,  
*McGill University, Canada*

Ross E. Traub,  
*Ontario Institute for  
Studies in Education, Canada*

Wim J. van der Linden,  
*University of Twente,  
The Netherlands*

Howard Wainer,  
*Educational Testing Service*

Rand R. Wilcox  
*University of Southern California*

**Technical Editor**

Jane L. Schleisman

## Volume 17

### Table of Contents

#### Articles

Reliability of Measurement and Power of Significance Tests Based on Differences <i>Donald W. Zimmerman, Richard H. Williams, and Bruno D. Zumbo</i>	1
Further Comments on Reliability and Power of Significance Tests <i>Lloyd G. Humphreys</i>	11
Reliability, Power, Functions, and Relations: A Reply to Humphreys <i>Donald W. Zimmerman, Richard H. Williams, and Bruno D. Zumbo</i>	15
Stability Coefficients in Longitudinal Studies <i>Joseph Levin</i>	17
Simplified Successive Intervals Scaling <i>Allen L. Edwards and Richard Gonzalez</i>	21
Assessing Essential Unidimensionality of Real Data <i>Ratna Nandakumar</i>	29
A Comparison of Lord's $\chi^2$ and Raju's Area Measures On Detection of DIF <i>Allan S. Cohen and Seock-Ho Kim</i>	39
A Structural Equation Model for Measuring Residualized Change and Discerning Patterns of Growth or Decline <i>Tenko Raykov</i>	53
Software Review Seven Confirmatory Factor Analysis Programs: EQS, EzPATH, LINCS, LISCOMP, LISREL 7, SIMPLIS, and CALIS <i>Niels G. Waller</i>	73
A Comparison of the Logistic Regression and Mantel-Haenszel Procedures for Detecting Differential Item Functioning <i>H. Jane Rogers and Hariharan Swaminathan</i>	105
Analysis of Cognitive Structure Using the Linear Logistic Test Model and Quadratic Assignment <i>Maria Medina-Diaz</i>	117
The Effects on Parameter Estimation of Correlated Dimensions and a Distribution Restricted Trait in a Multidimensional Item Response Model <i>Rose-Marie Batley and Marvin W. Boss</i>	131
Appropriateness Fit and Criterion-Related Validity <i>Neal Schmitt, José M. Cortina, and David J. Whitney</i>	143
A Model and Heuristic For Solving Very Large Item Selection Problems <i>Len Swanson and Martha L. Stocking</i>	151
Application of an Automated Item Selection Method to Real Data <i>Martha L. Stocking, Len Swanson, and Mari Pearlman</i>	167

A Numerical Approach for Computing Standard Errors of Linear Equating	<i>Lingjia Zeng</i>	177
Exact Person Tests for Assessing Model-Data Fit in the Rasch Model	<i>Michelle Liou</i>	187
Sensitivity of the Linear Logistic Test Model to Misspecification of the Weight Matrix	<i>Frank B. Baker</i>	201
Estimating Rater Agreement in $2 \times 2$ Tables: Correction for Chance and Intraclass Correlation	<i>Nicole J-M. Blackman and John J. Koval</i>	211
Standard Errors of Levine Linear Equating	<i>Bradley A. Hanson, Lingjia Zeng, and Michael J. Kolen</i>	225
Equating Tests Under The Nominal Response Model	<i>Frank B. Baker</i>	239
A Hyperbolic Cosine Latent Trait Model For Unfolding Dichotomous Single-Stimulus Responses	<i>David Andrich and Guanzhong Luo</i>	253
A Method for Severely Constrained Item Selection in Adaptive Testing	<i>Martha L. Stocking and Len Swanson</i>	277
Methodology Review		
Statistical Approaches for Assessing Measurement Bias	<i>Roger E. Millsap and Howard T. Everson</i>	297
Detection of Differential Item Functioning in the Graded Response Model	<i>Allan S. Cohen, Seock-Ho Kim, and Frank B. Baker</i>	335
Information Functions of the Generalized Partial Credit Model	<i>Eiji Muraki</i>	351
Effect of Estimation Method on Incremental Fit Indexes for Covariance Structure Models	<i>Hazuki M. Sugawara and Robert C. MacCallum</i>	365
Scale Shrinkage in Vertical Equating	<i>Gregory Camilli, Kentaro Yamamoto, and Ming-mei Wang</i>	379
Book Reviews		
<i>Differential Item Functioning</i> by Paul W. Holland and Howard Wainer (Eds.)	<i>Reviewed by Roger E. Millsap</i>	101
<i>Objective Measurement: Theory Into Practice</i> (Volume 1) by Mark Wilson (Ed.)	<i>Reviewed by Linda M. Collins</i>	196
<i>Fundamentals of Item Response Theory</i> (Volume 2) by Ronald K. Hambleton, H. Swaminathan, and H. Jane Rogers	<i>Reviewed by Kim May</i>	293
<i>Test Theory for a New Generation of Tests</i> by Norman Frederiksen, Robert J. Mislevy, and Isaac I. Bejar (Eds.)	<i>Reviewed by Michael T. Kane</i>	389

## Computer Program Exchange

EQUATE 2.0: A Computer Program for the Characteristic Curve Method of IRT Equating <i>Frank B. Baker</i>	20
ADTEST: A Maximum Information Computerized Adaptive Test <i>Javier Revuelta, Vicente Ponsoda, and Julio Olea</i>	28
RELCOEF: Testing the Equality of Intraclass Reliability Coefficients Obtained from Two Measurement Procedures <i>Michael S. Trevisan and Glen Scymanski</i>	72
PRASCH: A Fortran Program for Latent Class Polytomous Response Rasch Models <i>John M. Grego</i>	238
DIMENSION: A Program to Generate Unidimensional and Multidimensional Item Data <i>John Hattie and Krzysztof Krakowski</i>	252
POWER: An SPSS Matrix Program for Performing Univariate and Multivariate Power Analysis <i>Richard F. Haase</i>	295
FOX-PATH: A Microcomputer Program for Calculating Indirect, Spurious, and Unanalyzed Effects in Path Analysis <i>William N. Dudley and Daniel Boquist</i>	296
YeomanDG: A Data Generation Program (Version 1.0) <i>Ralph De Ayala</i>	393
GOMDS: An Aid for the Entry of MDS Data (Version 2.0) <i>John M. Martz</i>	394
Volume 17 Author and Subject Index	395

## Copyright and Permission

Published quarterly and copyrighted by Applied Psychological Measurement Inc., N657 Elliott Hall, University of Minnesota, Minneapolis MN 55455-0344, U.S.A. All rights reserved. No part of this publication may be reproduced in any form or by any means—electronic, mechanical, photocopying, recording, or otherwise—without the prior written permission of the publisher. The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made by libraries beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law, provided that the copier pay the stated per-copy fee through the Copyright Clearance Center, Inc., 21 Congress St., Salem MA 01970, U.S.A. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, all of which require written permission of the publisher. Reprinting requests should be addressed to *Applied Psychological Measurement*, N657 Elliott Hall, University of Minnesota, 75 E. River Road, Minneapolis MN 55455-0344, U.S.A.; phone 612-625-0342; Internet: DJWEISS@VX.CIS.UMN.EDU.